NEW SPECIES OF THE GENERA *MELISODERA* WESTWOOD, *RHAEBOLESTES* SLOANE AND *MORIODEMA* CASTELNAU FROM AUSTRALIA (COLEOPTERA: CARABIDAE: PSYDRINI)

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Abstract

Three Australian species of the psydrine genera *Melisodera* Westwood, *Rhaebolestes* Sloane and *Moriodema* Castelnau are described as new: *Melisodera gigas* from northern New South Wales, *Rhaebolestes lamingtonensis* from southeastern Queensland and *Moriodema regalis* from southeastern New South Wales. Keys to the species of the three genera are provided.

Introduction

During sorting material of carabid beetles in the Australian National Insect Collection, Canberra and those sent from the Queensland Museum, Brisbane, three hitherto undescribed species of Psydrini: Melisoderina of the genera *Melisodera* Westwood, *Rhaebolestes* Sloane and *Moriodema* Castelnau from Australia were located and are described in the present paper.

The psydrine subtribe Melisoderina (see Moore 1963, Baehr 1999, 2003), which Lorenz (1998, 2005) regarded as a separate tribe not to be included in Psydrini, occurs in southeastern Australia. It presently includes the genera *Melisodera* Westwood, 1835, *Celanida* Castelnau, 1867, *Moriomorpha* Castelnau, 1867, *Moriodema* Castelnau, 1867 and *Rhaebolestes* Sloane, 1903 (Moore 1963). Most of these genera are so far monospecific, with only *Moriomorpha* presently including two species. All melisoderine species are medium to large, dark reddish to black beetles with a distinct apical sublateral elytral ridge, an elongate metepisternum and metasternum and lack a double row of adhesive setae on their male fore tarsi. Moore (1963) redefined the genera of the Melisoderina and his key to the genera still applies. A separate paper deals with the genus *Moriomorpha* (Baehr in press).

Materials and methods

Measurements were taken using a stereo microscope with an ocular micrometer: body length from apex of labrum to apex of elytra; length of orbit from the posterior margin of the eye to the "neck" angle; length of pronotum along midline; width of apex of pronotum at the most advanced part; length of elytra from the most advanced part of the humerus to the very apex. For estimation of the relative length of the antenna the 6th antennomere was measured; for its width measurement the depressed surface was chosen.

For dissection of the male genitalia the specimens were softened for a night in a jar under moist atmosphere, then the genitalia were removed and cleaned for a short while in hot KOH. The habitus photographs were taken with a digital camera using ProgRes Capture Pro 2.6 and AutoMontage and then worked with Corel Photo Paint 11.

Label data for type specimens are given in full with exact wording, including all ciphers, notes of determinators and curators and printed labels. A / with a blank before and after it denotes a new label, two blanks mark a new line on the same label. Holotypes of the new species are deposited in the Australian National Insect Collection, Canberra (ANIC) and the Queensland Museum, Brisbane (QM).

Abbreviations

Abbreviations used are: ACT – Australian Capital Territory; NSW – New South Wales; QLD – Queensland; VIC – Victoria; ce. – central eastern; e. – eastern; ne. – northeastern; s. – southern; se. – southeastern; > – larger or longer than; < – smaller or shorter than.

Genus *Melisodera* Westwood

Melisodera Westwood, 1835: pl. 132. – Csiki 1929: 485; Moore 1963: 281; Moore *et al.* 1989: 153; Lorenz 1998: 224; 2005: 245. Type species: *Melisodera picipennis* Westwood, 1835, by monotypy.

Diagnosis. Large, elongate species with well developed metathoracic wings, cordate, bisetose pronotum, short antennae, laterally well produced eyes, squamose male protarsi, straight mesotibiae and dorsoventrally depressed tarsi.

Comments. Until now only the type species was recorded. Csiki (1929) united this genus with *Moriomorpha* Castelnau and *Moriodema* Castelnau, but this decision has neglected the important character states that distinguish the three genera, which were reinstated by Moore (1963). Lorenz (1998, 2005) erroneously included *Moriomorpha victoriae* Castelnau in this genus. The nominate species, *M. picipennis* Westwood, 1835, occurs from eastern Victoria to southeastern New South Wales and the Australian Capital Territory (Moore 1963, 1964).

Melisodera picipennis Westwood (Fig. 5)

Melisodera picipennis Westwood, 1835: pl. 132. – Csiki 1929: 485; Moore 1963: 281; Moore *et al.* 1987: 153; Lorenz 1998: 224; 2005: 245.

Additional records. VICTORIA: 1 ♀, Mt. Macedon, H.W. Davey (ANIC); 1 ♂, Lake Mountain, 1450 m, 6.ii.1994, G.J. Krake (Coll. W. Lorenz, Tutzing). AUSTRALIAN CAPITAL TERRITORY: 1 ♀, Mt Gingera, 6.ii.1964, B.P. Moore (ANIC).

Diagnosis. Easily distinguished from *M. gigas* sp. n. by its much smaller size and narrower, much less cordate prothorax. See below for measurements.

Comments. Occurs from eastern Victoria to southeastern New South Wales and the Australian Capital Territory (Moore 1963, 1964). Moore (1964) described its larvae, collected with teneral adults, found apparently feeding on stag beetle larvae inside a log in alpine woodland at high altitude.

Melisodera gigas sp. n. (Figs 1, 6, 11)

Type. Holotype ♀, NEW SOUTH WALES: 'F.W. / N.S.W. Ebor 13.1.1963 J. Balderson' (In ANIC).

Diagnosis. Easily distinguished from *M. picipennis* Westwood by its much larger size and its very wide, markedly cordate prothorax.

Description. Measurements. Length: 17.4 mm; width: 5.7 mm. Ratios. Length eye/orbit: 4.5; length/width of 6th antennomere: 0.95; width/length of pronotum: 1.43; width of apex/width of base of pronotum: 1.04; widest diameter/width of base of pronotum: 1.39; length/width of elytra: 1.82.

Colour (Fig. 11). Head and pronotum black, elytra dark brown; palpi, femora and apices of protibiae reddish-piceous; antennae, tibiae and tarsi black. Undersurface black but abdomen dark piceous.

Head (Fig. 11). Head of average size but much narrower than the pronotum. Eye relatively small but laterally markedly projecting. Orbit short, very convex, forming an almost right angle with the neck. Clypeal suture distinct; clypeus anteriorly slightly concave; labrum anteriorly moderately concave. Mandibles short, inner surface parallel-sided, towards apex markedly incurved. Scrobe in basal part deep; seta in scrobe elongate. Mentum bisetose, with short, obtuse tooth. Submentum bisetose and with two deep pits between setae; setae elongate. Glossa elongate, with two elongate setae; paraglossae hyaline, narrow, far surpassing the glossa. Lacinia with two rather dense rows of setae. Both palpi rather compact, impilose, with obtuse apex. Antennae very short; median antennomeres wider than long, 1st-3rd antennomeres glabrous, from 5th antennomere lateral surfaces with dense setosity and glandular areas. Frons raised laterally and in middle; frontal sulci deep, irregularly triangular, curved laterad in posterior part. Inner margin of eye with a deep sulcus which encircles the eye posteriad and on the upper surface behind frons is joined by a shallow, transverse but slightly convex sulcus. Posterior supraorbital seta inserted in front of posterior margin of eye. Surface extremely finely, sparsely punctate, lacking microreticulation, very glossy; punctures only visible at very high magnification. Only labrum with very fine, superficial, isodiametric microreticulation.

Pronotum (Fig. 6). Cordiform, short and very wide; base about as wide as apex, widest diameter at apical third. Apex straight in middle; apical angles very slightly produced but widely rounded. Lateral margins very convex, sinuate just in front of base. Basal angles rectangular, slightly produced laterad; base straight in middle, slightly oblique laterally. Dorsal surface very convex. Apex in middle not margined, lateral border narrowly margined, margin slightly upturned; lateral sulcus narrow and rather shallow, not widened towards base; base distinctly margined. Median line distinct, slightly impressed and very finely crenulate, almost reaching apex, deepened towards base. Anterior transverse sulcus barely indicated; posterior sulcus distinct.

Basal grooves rather deep, wide, laterally with a linear impression. Anterior marginal seta situated at widest diameter at apical third; posterior marginal seta situated at basal angle. Surface with some very shallow transverse impressions; with extremely fine punctures which are perceptible only at very high magnification; without microreticulation; very glossy.

Elytra (Fig. 11). Elongate, largely parallel-sided, dorsally very convex. Humeral angle rounded with tiny denticle. Lateral margin in basal third very slightly concave, then straight; apical part evenly rounded to suture. Scutellary stria elongate, situated on 1st interval, consisting of about 8 deep punctures. Basal margin remarkably crenulate. Six median striae complete, deeply impressed and very coarsely punctate, only near apex impunctate; 7th stria barely visible. Six median intervals gently convex. Subapical carina distinct. Scutellary pore and seta absent. 3rd interval with two setiferous punctures behind middle, both adjacent to 3rd stria. Marginal series consisting of 15-16 punctures and setae, rather interrupted in middle; punctures small, setae of very variable length. At apex with an elongate seta situated near end of 3rd stria. Intervals impunctate and glabrous, with extremely fine and highly superficial microreticulation that consists of very dense, irregularly isodiametric to slightly transverse meshes, only visible at very high magnification.

Lower surface. Impunctate and impilose, with extremely fine and highly superficial microreticulation which is only visible at very high magnification. Metepisternum narrow and elongate, about 2.5 x as long as wide at apex. Terminal abdominal sternum in female polysetose, with 4 setae on the one and 3 setae on the other side.

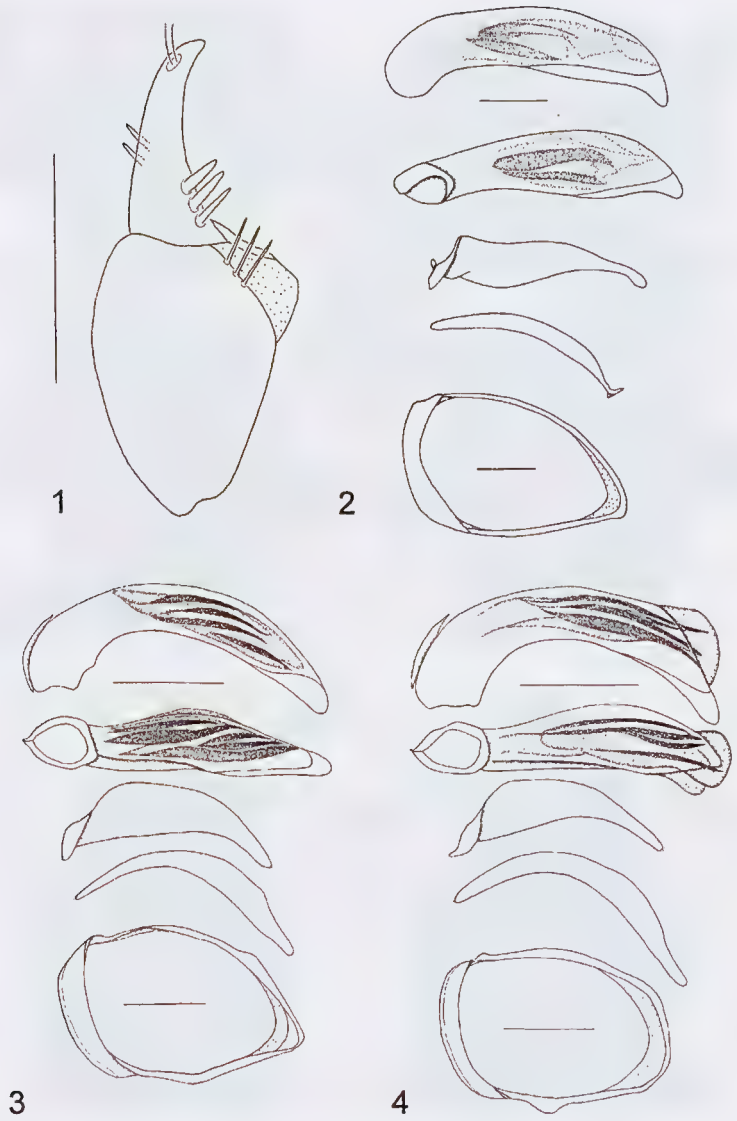
Legs. Rather short and compact. All tibiae straight. Protibiae sulcate at anterior surface, on lateral surface with 5-6 serrations and short ensiform setae, the apex produced laterad. Lateral part of apex of mesotibiae strongly produced laterad, lower and anterior surfaces with dense fringe of setae, dorsal surface slightly serrulate. Tarsi short, slightly depressed; 5th tarsomeres with 2 pairs of setae at lower surface. Tarsal claws elongate, glabrous.

Male genitalia. Unknown.

Female genitalia (Fig. 1). Gonocoxite 1 elongate, with three elongate setae at ventro-lateral rim. Gonocoxite 2 narrow and elongate, almost straight, only towards apex slightly curved, with three elongate ensiform setae at the medio-lateral margin close to base, two slightly shorter ensiform setae at about middle of the dorso-median margin and two fairly elongate nematiform setae arising from a circular pit close to apex.

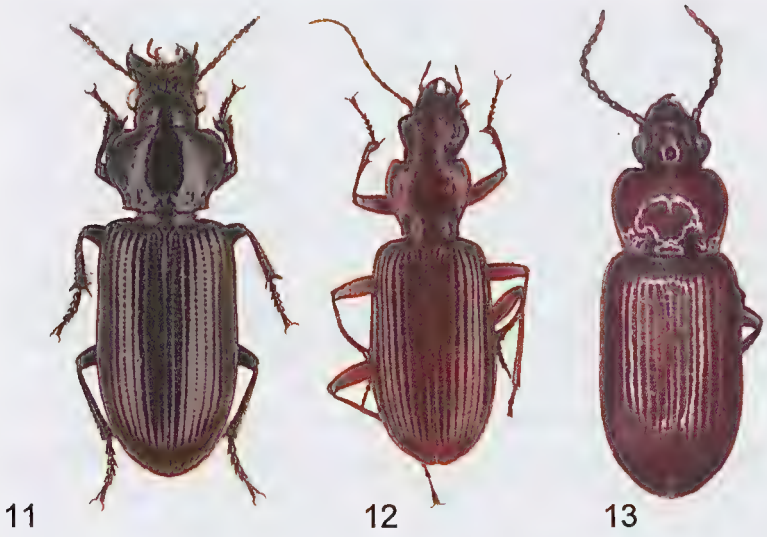
Variation. Unknown.

Etymology. The Greek word '*gigas*' means 'enormous' and refers to the very large size of the species as compared with its congener.



Figs 1-4. (1) *Melisodera gigas* sp. n. Female gonocoxites 1 and 2. Scale bar: 0.5 mm. (2-4) Male genitalia: aedeagus, left side and lower surface, left and right parameres, genital ring. Scale bars: 0.5 mm. (2) *Rhaebolestes lamingtonensis* sp. n.; (3) *Moriodema mcoyei* Castelnau; (4) *M. regalis* sp. n.

Figs 5-10. (5-8) Pronotum. (5) *Melisodera picipennis* Westwood; (6) *M. gigas* sp. n.; (7) *Rhaebolestes walkeri* Sloane, holotype; (8) *R. lamingtonensis* sp. n. (9-10) Head and pronotum. (9) *Moriodema mcoyei* Castelnau; (10) *M. regalis* sp. n.



Figs 11-13. Habitus. (11) *Melisodera gigas* sp. n.; (12) *Rhaebolestes lamingtonensis* sp. n.; (13) *Moriodema regalis* sp. n. Body lengths: 17.4 mm; 15.2 mm; 8.8 mm.

Distribution. New England Tableland, northeastern New South Wales.

Collecting circumstances. Not recorded.

Comment. This specimen was mentioned previously by Moore (1963) as a probable new species.

Measurements and ratios of the species of *Melisodera*

N = number of specimens measured; body length in mm; l eye/orbit = ratio length of eye/length of orbit; l/w 6th ant = ratio length/width of 6th antennomere; w/l pron = ratio width/length of pronotum; apex/base pron = ratio width of apex/width of base of pronotum; dia/base pron = ratio widest diameter/width of base of pronotum; l/w elytra = ratio length/width of elytra.

Species	N	Body length	l eye/ orbit	l/w 6th ant	w/l pron	Apex/ base pron	Dia/base pron	l/w elytra
M. picipennis	3	11.2-11.5	3.7-3.8	1.0	1.25-1.30	0.96-0.98	1.21-1.23	1.75-1.80
M. gigas	1	17.4	4.5	0.95	1.43	1.04	1.39	1.82

Key to the species of the genus *Melisodera* Westwood

1 Body size larger, length >17 mm; eye laterally more produced; pronotum relatively wider, with narrower base, strongly cordiform, ratio width/length > 1.40 (Fig. 6). New England Tableland, ne. NSW ..... *gigas* **sp. n.**

– Body size smaller, length <12 mm; eye laterally slightly less produced; pronotum relatively narrower, with wider base, less cordiform, ratio width/length < 1.30 (Fig. 5). e. Vic, ACT, se. NSW .... *picipennis* Westwood, 1835

Genus *Rhaebolestes* Sloane

Rhaebolestes Sloane, 1903: 589. – Csiki 1929: 486; Moore 1963: 280; Moore *et al.* 1987: 153; Lorenz 1998: 224; 2005: 245. Type species: *Rhaebolestes walkeri* Sloane, 1903, by monotypy.

Diagnosis. Large, narrow and elongate species characterized by presence of the metathoracic wings, elongate antennae, moderately protruded eyes, squamose male protarsi, markedly curved mesotibiae and tarsi weakly laterally compressed.

Rhaebolestes walkeri Sloane (Fig. 7)

Rhaebolestes walkeri Sloane, 1903: 589. – Csiki 1929: 486; Moore 1963: 280; Moore *et al.* 1987: 153; Lorenz 1998: 224; 2005: 245.

Type. Holotype ♂, 'Ourimbah Sydney district N.S.W. J.J.W. 14/4/1900 / *Rhabolestes walkeri* Sl. / HOLOTYPE *Rhabolestes walkeri* Sl. PJD' (In ANIC).

Diagnosis. Very similar to *R. lamingtonensis* sp. n.; distinguished by less cordiform pronotum having a wider base and its apex slightly sinuate and the basal margin of the elytra slightly oblique. See below for measurements.

Comments. The type locality is about 60 km north of Sydney. Unfortunately the unique male holotype lacks genitalia so comparison with the genitalia of *R. lamingtonensis* is not possible.

Rhaebolestes lamingtonensis sp. n. (Figs 2, 8, 12)

Type. Holotype ♂, QUEENSLAND: 'Binna Burra Lamington NP, Qld. 3 Feb 1963 G. Monteith QM Reg No. T89290' (In QM: Type Reg. No. QMT 82920).

Diagnosis. Very similar to *R. walkeri* Sloane, distinguished by a more cordiform pronotum having a narrower base and with its apex not sinuate and the basal margin of the elytra almost straight.

Description. Measurements. Length: 15.2 mm; width: 5.0 mm. Ratios. Length eye/orbit: 1.0; length/width of 6th antennomere: 1.85; width/length of pronotum: 1.10; width apex/base of pronotum: 1.33; widest diameter/width of base of pronotum: 1.51; length/width of elytra: 1.78.

Colour (Fig. 12). Upper and lower surfaces uniformly reddish, only apex of mandibles and apical antennomeres very slightly darker.

Head (Fig. 12). Comparatively narrow and elongate. Eye relatively small, about as long as the orbit, laterally moderately projecting. Orbit oblique and slightly convex, forming a weak angle with the neck. Clypeal suture distinct;

labrum gently concave anteriorly. Mandibles very elongate, with elongate mandibular seta in the scrobe. Mentum bisetose, with tooth wide and shallow, obtuse at apex. Gula quadrisetose; setae very long. Glossa elongate, with two very long setae; paraglossae hyaline, narrow, far surpassing the glossa. Lacinia with a few obtuse teeth and sparse setae. Both palpi narrow and elongate, impilose, obtuse at apex. Antennae comparatively elongate, surpassing base of pronotum by about one antennomere; 1st-3rd antennomeres glabrous, central antennomeres almost twice as long as wide, densely pilose on the narrow surfaces. Frons slightly convex; frontal sulci shallow, bisinuate; middle of frons with a few shallow, linear impressions. Neck sulcus not impressed. Posterior supraorbital seta inserted narrowly in front of the posterior margin of the eye. Surface impunctate, almost lacking microreticulation; very glossy. Only laterally extremely fine traces of highly superficial, transverse microreticulation are visible at very high magnification.

Pronotum (Fig. 8). Cordiform, rather narrow, base much narrower than apex, widest behind basal third. Apex in middle excised though straight, apical angles well produced, obtusely rounded at tip. Lateral margins evenly convex, a short distance in front of base excised and there almost straight. Basal angles rectangular, base straight, laterally very slightly oblique. Dorsal surface rather depressed. Apex not margined, lateral border narrowly margined, margin slightly upturned, lateral sulcus narrow and slightly impressed, base distinctly margined. Median line very shallow, not reaching apex or base. Anterior transverse sulcus barely perceptible; posterior transverse sulcus quite deep. Basal grooves deep, rather linear. Anterior marginal seta situated at widest point behind apical third, posterior marginal seta situated at basal angle. Surface impunctate, with several very fine transverse strioles and with occasional traces of very superficial and extremely fine, transverse microreticulation visible only at very high magnification; surface very glossy.

Elytra (Fig. 12). Elongate, slightly widened towards apical third, dorsally convex though disk depressed. Humeral angle almost evenly rounded. Lateral margin in basal third very slightly concave, then gently convex; apical part evenly rounded to suture. Scutellary stria elongate. All striae present and complete, moderately impressed, barely punctate. Intervals gently convex. Subapical carina weakly developed and rather short. Scutellary pore and seta situated at base of 2nd stria. 3rd interval with three setiferous punctures, all adjacent to 3rd stria. Marginal series consisting of 17 punctures and setae, rather interrupted in middle; punctures small; setae of very different length. At apex with an elongate seta situated near end of 5th stria and with a smaller one medially of it. Intervals impunctate, with extremely fine and very superficial microreticulation that consists of very dense, transverse lines, visible only at high magnification.

Lower surface. Impunctate and impilose, with extremely fine and very superficial microreticulation of very dense transverse lines. Metepisternum narrow and elongate, about 2.5 x as long as wide at apex. Terminal abdominal sternum quadrisetose in male.

Legs. Comparatively very slender and elongate, particularly the tibiae. Profemur with a strongly protruded tooth on anterior surface proximal of middle. Protibia very slightly curved; three basal tarsomeres of male protarsus asymmetric, bearing a sparse vestiture of adhesive hairs. Mesotibia markedly curved, inner surface with dense fringe of setae, outer surface slightly serrulate. Tarsi narrow and elongate, meso- and metatarsi weakly compressed laterally, protarsi less distinctly compressed; 5th tarsomeres glabrous at lower surface. Tarsal claws extremely slender and elongate, glabrous.

Male genitalia (Fig. 2). Genital ring wide, oval-shaped, asymmetric, with wide, oblique base and narrowly rounded apex. Aedeagus rather compact, asymmetric, apex obtusely rounded, slightly curved down and directed to the right side. Orifice very elongate, situated on the upper surface. Folding of internal sac simple, with two elongate, weakly sclerotized folds in middle. Both parameres large and elongate, asetose, the left larger than the right.

Female genitalia. Unknown.

Variation. Unknown.

Etymology. The name refers to the type locality of this species, Lamington National Park.

Distribution. Lamington Nat. Pk, southeastern Queensland. Known only from the type locality.

Collecting circumstances. Not recorded.

Measurements and ratios of the species of *Rhaebolestes*
For abbreviations see under *Melisodera*.

Species	N	Body length	l eye/ orbit	l/w 6th ant	w/l pron	Apex/ base pron	Dia/base pron	l/w elytra
R. walkeri	1	15.7	1.0	1.95	1.08	1.15	1.35	1.75
R. lamingtonensis	1	15.2	1.0	1.90	1.10	1.33	1.51	1.78

Key to the species of the genus *Rhaebolestes* Sloane

1 Base of pronotum wider, ratio widest diameter/base 1.35 (Fig. 7); base of elytra distinctly oblique, basal angle slightly angulate; apex of elytra distinctly sinuate, lateral margin not excised at basal third. ce. NSW (slightly north of Sydney) ..... *walkeri* Sloane, 1903

– Base of pronotum narrower, ratio widest diameter/base 1.50 (Fig. 8); base of elytra almost transverse, basal angle barely angulate; apex of elytra not sinuate, lateral margin perceptibly excised at basal third. se. QLD (Lamington National Park) ..... *lamingtonensis* **sp. n.**

Genus *Moriodema* Castelnau

Moriodema Castelnau 1867: 38. – Castelnau 1868: 124; Sloane 1903: 587; Csiki 1929: 485; Moore 1963: 281; Moore et al. 1987: 154; Lorenz 1998: 224; 2005: 245. Type species: *Moriodema mcoyei* Castelnau, 1867 (= *Moriodema paramattensis* Castelnau, 1867), by subsequent designation by Moore (1963).

Comments. Medium sized species, characterized by rather wide and depressed body shape, presence of the metathoracic wings, short antenna, laterally moderately projected eyes, squamose male protarsi, almost straight mesotibiae and dorsoventrally depressed tarsi.

Moriodema mcoyei Castelnau (Figs 3, 9)

Moriodema mcoyei Castelnau 1867: 39. – Castelnau 1868: 125; Csiki 1929: 485; Moore 1963: 281; Moore *et al.* 1987: 154; Lorenz 1998: 224; 2005: 245.

Moriodema paramattensis Castelnau 1867: 39. – Sloane 1903: 587.

Additional record. QUEENSLAND: 1 ♀, Binna Burra, Lamington Nat. Pk., 25.iii.-4.iv.1985, J. & N. Lawrence (ANIC). Lectotype and some specimens from eastern Victoria and southeastern New South Wales also examined.

Diagnosis. Distinguished from *M. regalis* sp. n. by wider pronotum, wider and shorter elytra, larger and more produced eyes, slightly less curved aedeagus which has a slightly wider apex and much more triangular genital ring.

Partial redescription. Measurements. Length: 8.7-9.9 mm; width: 3.25-3.6 mm. Ratios. Length eye/orbit: 2.9-3.0; length/width of 6th antennomere: 1.0; width/length of pronotum: 1.31-1.36; width of apex/width of base of pronotum: 0.82-0.84; widest diameter/width of base of pronotum: 1.22-1.25; length/width of elytra: 1.66-1.69. For shape of head and pronotum see fig. 9.

Male genitalia (Fig. 3). Genital ring large, asymmentrically triangular but laterally slightly convex, with oblique apex shortly rounded at the tip. Aedeagus narrow, laterally compressed, widened in middle, evenly narrowed towards apex; lower surface in apical half straight, with a distinct ridge in basal half. Apex short and fairly wide, widely rounded at tip. Orificium rather short, situated on upper right side. Internal sac with several elongate, moderately sclerotized folds. Both parameres comparatively short and stout, with rather short apices. The very apex of both parameres with two or three extremely short setae which are visible only at very high magnification.

Distribution. According to Moore *et al.* (1987) this species was recorded from eastern Victoria, southeastern New South Wales and the Australian

Capital Territory. The new records extend the range to include southeastern Queensland.

Collecting circumstances. Mostly unrecorded, but the specimen from Lamington NP was 'collected at light'.

Comments. Moriodema paramattensis Castelnau was synonymized with *M. mcoyei* Castelnau by Sloane (1903). I examined the lectotype of *M. mcoyei* from the Genoa Museum.

***Moriodema regalis* sp. n.** (Figs 4, 10, 13)

Type. Holotype ♂, NEW SOUTH WALES: 'N.S.W: 34.152°Sx151.019°E Fosters Flat, Royal NP, 18Apr2011 GMonteith Barkspray, RF along creek., 90m 18873' (In QM: Type Reg. No. QMT 156032).

Diagnosis. Distinguished from *M. mcoyei* Castelnau, 1867 by its narrower pronotum, narrower and longer elytra, smaller and less produced eyes, slightly more curved aedeagus which has a slightly narrower apex and genital ring almost quadrangular.

Redescription. Measurements. Length: 8.8 mm; width: 3.2 mm. Ratios. Length eye/orbit: 2.5; length/width of 6th antennomere: 1.0; width/length of pronotum: 1.26; width of apex/width of base of pronotum: 0.82; widest diameter/width of base of pronotum: 1.20; length/width of elytra: 1.74.

Colour (Fig. 13). Upper and lower surfaces, including the mouth parts, uniformly chestnut brown, only the anterior part of the head and the mandibles slightly darker. Apex of palpi lighter. Antennae blackish, but basal antennomere dark reddish. Femora reddish; tibiae and tarsi rather contrastingly dark piceous to almost black.

Head (Fig. 10). Head of average size. Eye relatively large, laterally rather projecting. Orbit oblique and slightly convex, forming a weak angle with the neck. Clypeal suture distinct; clypeus anteriorly very slightly concave; labrum anteriorly moderately concave. Mandibles comparatively short, inner surface in basal half parallel-sided, towards apex markedly incurved. Mentum bisetose, with feeble tooth. Submentum bisetose, setae elongate. Glossa elongate, with two elongate setae; paraglossae hyaline, narrow, far surpassing the glossa. Lacinia with two moderately dense rows of setae. Both palpi narrow and elongate, impilose, obtuse at apex. Antennae very short, median antennomeres about as long as wide; 1st-3rd antennomeres glabrous, other antennomeres densely pilose; from 5th antennomere lateral surfaces with even denser pilosity and glandular fields. Frons and clypeus very slightly convex in middle; clypeal suture deep; frontal sulci moderately deep, oblique, slightly curved laterad. Inner margin of eye with a narrow sulcus. Neck sulcus barely impressed. Posterior supraorbital seta inserted just at posterior margin of eye. Surface glossy, with very fine, extremely superficial

microreticulation, only visible at very high magnification. Only labrum with fine, isodiametric microreticulation.

Pronotum (Fig. 10). Barely cordiform, rather wide, base wider than apex, widest point slightly behind apical third. Apex with shallow excision, apical angles slightly produced, widely rounded. Lateral margins at anterior two thirds evenly convex, then almost straight, near base very slightly sinuate. Basal angles almost right, barely produced laterad, base in middle straight, laterally slightly oblique. Dorsal surface rather depressed. Apex not margined, lateral border rather narrowly margined, margin slightly upturned; lateral sulcus narrow and rather shallow, slightly widened towards base; base distinctly margined. Median line shallow, not reaching apex or base. Anterior transverse sulcus barely perceptible; posterior sulcus distinct though shallow. Basal grooves deep and wide, at bottom with two inconspicuous, short, straight impressions. Anterior marginal seta situated slightly behind apical third, slightly removed from margin; posterior marginal seta situated slightly in front of basal angle. Surface almost devoid of transverse impressions, with extremely fine, sparse punctures and here and there with traces of highly superficial, fine microreticulation consisting of transverse lines. Both punctures and microreticulation perceptible only at very high magnification; surface very glossy.

Elytra (Fig. 13). Rather elongate, parallel-sided, dorsally convex though disk depressed. Humeral angle obtusely angulate. Lateral margin straight, apical curvature very slightly sinuate. Scutellary stria elongate, in 1st interval. Six median striae complete and impressed throughout, distinctly punctate-crenulate; 7th stria in anterior half not impresed, finely punctate throughout. Six median intervals very gently convex, lateral intervals depressed. Subapical carina distinct. Scutellary pore and seta situated at base of 1st stria. 3rd interval with a single setiferous puncture slightly in front of apical third, adjacent to 3rd stria. Marginal series consisting of 13-14 punctures and setae, widely interrupted in middle; punctures small, setae of very different length. At apex with an elongate seta situated inside of the subapical carina, and with a smaller one at end of 2nd stria. Intervals not perceptibly punctate, with traces of extremely fine and highly superficial microreticulation that consists of transverse lines, only visible at very high magnification.

Lower surface. Impunctate and impilose, with extremely fine and very superficial microreticulation only visible at very high magnification. Metepisternum narrow and elongate, slightly > 2 x as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Moderately slender and elongate. Profemur unarmed on lower surface. Protibia slightly curved, sulcate at anterior surface. Mesotibia almost straight. Tarsi narrow and comparatively short, dorso-ventrally depressed; 5th tarsomeres with one pair of setae at lower surface. Tarsal claws elongate, glabrous.

Male genitalia (Fig. 4). Genital ring large, irregularly quadrate, laterally slightly convex, with wide, almost transverse apex. Aedeagus rather narrow, laterally compressed, markedly widened in middle, convexly narrowed towards apex; lower surface concave throughout, with a distinct ridge in basal half. Apex short and narrow, shortly triangular at tip. Orifice rather short, situated on upper right side. Internal sac with several elongate, moderately sclerotized folds. Both parameres comparatively short and stout, with rather short apices. The very apex of both parameres with two or three extremely short setae visible only under very high magnification.

Female genitalia. Unknown.

Variation. Unknown.

Etymology. The Latin word '*regalis*' means 'belonging to the king' and refers to the type locality of the species, Royal National Park.

Distribution. Royal National Park immediately south of Sydney, southeastern New South Wales. Known only from the type locality.

Collecting circumstances. The holotype was collected by pyrethrin fogging of the broken, partly decayed trunk of a newly-fallen eucalypt tree at the interface of rainforest and eucalypt forest. The parts of the tree sprayed were 1-2 metres above the ground. The break exposed internal cavities in the log and the specimen might have come from these. Several *Phoracantha* longicorn beetles came from the same situation, indicating that there might have been larval prey available for the carabid.

Measurements and ratios of the species of *Moriodema*
For abbreviations see under *Melisodera*.

Species	N	Body length	l eye/ orbit	l/w 6th ant	w/l pron	Apex/ base pron	Dia/base pron	l/w elytra
M. mcoyei	7	8.7-9.9	2.9-3.0	1.0	1.31-1.36	0.82-0.84	1.22-1.25	1.66-1.69
M. regalis	1	8.8	12.5	1.0	1.26	0.82	1.20	1.74

Key to the species of the genus *Moriodema* Castelnau

1 Prothorax wider, ratio width/length > 1.30; elytra shorter and wider, ratio length/width < 1.70; eye larger and laterally more produced, orbit shorter and more oblique (Fig. 9); aedeagus slightly less concave on the ventral surface, with wider apex, genital ring triangular (Fig. 3). e. VIC, e. NSW, ACT, se. QLD ..... *mcoyei* Castelnau, 1867

– Prothorax narrower, ratio width/length 1.26; elytra longer and narrower, ratio length/width 1.74; eye smaller and laterally less produced, orbit longer and less oblique (Fig. 10); aedeagus slightly more concave on the ventral surface, with narrower apex, genital ring almost quadrangular (Fig. 4). Royal National Park, se. NSW ..... *regalis* **sp. n.**

Discussion

The psydrine subtribe Melisoderina was previously known only from the southeastern mainland of Australia, north to Armidale (30°30'S) in northern New South Wales (Moore *et al* 1987). The records in the present paper of *Rhaebolestes lamingtonensis* and *Moriodema mcoyei* from Lamington National Park confirm the occurrence of the subtribe another 270 km further north, into the southern corner of Queensland at 28°03'S. Elsewhere (Baehr in press), I record the genus *Moriomorpha* another 1200 km further north into the tropics of Queensland at about 19°00'S. Specimens of all genera are rare or very rare in collections.

The hitherto monospecific genera *Melisodera* and *Rhaebolestes* now exhibit similar distribution patterns, each with one southern and one northern species separated by a quite wide distributional gap, at least at present knowledge. However, the present paper shows that our knowledge of diversity and distribution of melisoderine species is quite fragmentary; some of the additional species are from areas quite outside the putative ranges of the respective genera but all these new species are known from single specimens. This suggests that these melisoderines are either actually rare in nature or they have secretive habitats which render their collection difficult. But it also shows that we have far from an exhaustive knowledge of their species diversity and distribution and that more species may be detected and the ranges of the known species may be extended in future.

Very little is known about ecology and ethology of any melisoderine species. Published information and communications from Geoff Monteith (Brisbane) suggests that some species live inside hollow logs and dead trees, where they probably feed on larvae of various wood-inhabiting beetles (Moore 1964, Monteith in litt., Sloane 1903, Baehr in press). In the southern part of the subtribe's range, most species have been collected in sclerophyll forest rather than in rainforest. But in the subtropics and tropics, the few records are from subtropical and tropical montane rainforest.

The record of *Moriodema mcoyei* at light demonstrates that this species flies deliberately and this could explain its wide range, which extends from southern Victoria along the whole southeast coast of Australia to southeastern Queensland.

The mode of life mentioned probably accounts for the rarity of specimens in collections and the apparent rarity of most species is a good reason for intensified collecting and study of habits and life histories of the melisoderines. However, even more important, in my view, is that the non-arboricolous Psydrini are critical for phylogenetic studies, because this tribe holds a position at a crucial node in the phylogenetic tree of the Carabidae and probably gave rise to most of the more evolved carabid groups. So further exploration, which primarily means sampling, of this most interesting group of carabid beetles is an important task.

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